The Beagle, Records of the Museums and Art Galleries of the Northern Territory, 2001 **17**: 27-36

A new genus of small gobiid fish (Teleostei, Gobiidae) from the Indo-west Pacific, with description of two new species

HELEN K. LARSON[1] AND DOUGLASS F. HOESE[2]

[1]*Museum and Art Gallery of the Northern Territory,*
GPO Box 4646, Darwin NT 0801, AUSTRALIA
helen.larson@nt.gov.au
[2]*The Australian Museum, 6-8 College Street,*
Sydney NSW 2000, AUSTRALIA
dongh@austmus.gov.au

ABSTRACT

A new genus, *Tryssogobius*, is created for two new species of Indo-west Pacific gobiids (*T. colini* n. sp. and *T. longipes* n. sp.). The two species are distinguished by differences in fin rays counts, oculoscapular pores, body shape, and coloration. Both species are small, less than 30 mm SL, and occur in relatively deep coral reef habitats, where they hover above the substrate in a manner reminiscent of the microdesmid *Nemateleotris*.

KEYWORDS: Gobiidae, new genus, new species, *Tryssogobius colini*, *Tryssogobius longipes*.

INTRODUCTION

In 1986, Pat Colin sent the senior author a small collection of colour slides and gobiid fishes from Motupore Island, Papua New Guinea, to identify. Among the fishes were three specimens which bore little resemblance to any described genus, having enlarged interorbital scales, scales on the preopercles, opercles and branchiostegal rays, and no preopercular pores. A search among other "mystery" goby material from other institutions revealed additional specimens, and the realisation that the specimens comprised two species. Most specimens were from relatively deep water (27-82 m). One of the new species, small but elegant in form and colouring, has appeared in diving magazines and popular books (e.g. Kuiter 1992; Suzuki and Senou 1996; Okamura and Amaoka 1997). Other coral reef goby genera with scaled preopercles and opercles include *Exyrias* and *Macrodontogobius*. However, these relatively large gobies have three to four rows of scales on the preopercle, subterminal mouths, preopercular pores and the rear portion of the oculoscapular canal is present over the opercle.

It is not unusual to find new species or even new genera among gobiid fishes, as it has been estimated that there may be over 2,000 species among the Gobioidei (Hoese 1993). Many of the new taxa are from deeper water, or from infrequently-sampled localities or habitats. Unfortunately, given the state of taxonomy today, it may take up to 90 years to describe the taxa we know of today, to say nothing of those yet to be discovered (Hoese 1986).

Abbreviations used are: AMS: Australian Museum, Sydney; BPBM, Bishop Museum Honolulu; KPM, Kanagawa Prefectural Museum of Natural History, Odawara; NTM, Museum and Art Gallery of the Northern Territory, Darwin; OMNH, Osaka Museum of Natural History, Osaka; USNM, National Museum of Natural History, Washington, D.C.; WAM, Western Australian Museum, Perth; SL: standard length in mm; HL, head length in mm; TRB: transverse scale count backward from anal fin origin.

SYSTEMATICS

Family Gobiidae
Subfamily Gobiinae
Tryssogobius new genus

Type species. *Tryssogobius colini* new species, by original designation.

Diagnosis. Head and body scaled (Fig. 1); branchiostegal membranes scaled in one species. Predorsal with cycloid scales, increasing in size anteriorly, reaching forward to eyes; anteriormost scale slightly smaller than eye, extending above middle of eye. Operculum covered with 2-4 large cycloid scales. Cheek with large cycloid scales; scales under eye embedded. Gill opening extends

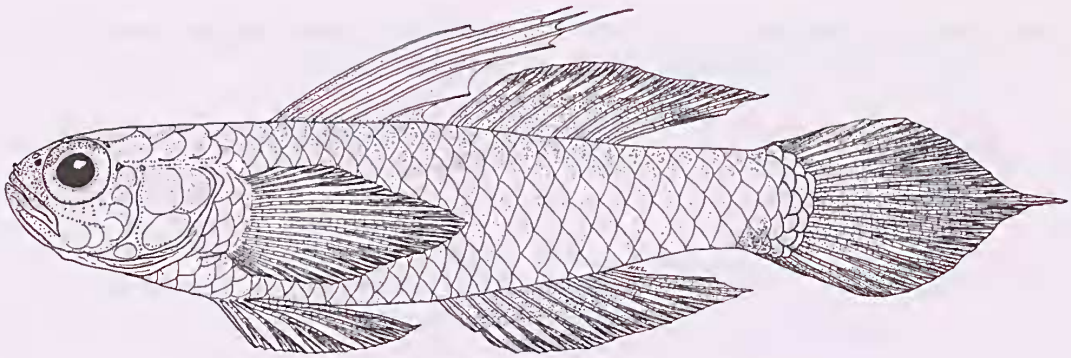

Fig. 1. Holotype of *Tryssogobius colini* n. g., n. sp., NTM S.12561-001, 29 mm SL male.

forward to below opercle or to posterior preoperculum margin. Isthmus broad and covered with medium sized scales. Pelvic fins fused, forming a cup-shaped disc, reaching to below anus or further back. Median interorbital pores closely spaced, placed just before anteriormost predorsal scale; occasionally pores fused together. Jaws short and very oblique.

Osteology. Information from two specimens of *T. colini* n. sp. , one cleared and double-stained 18 mm SL male (ex NTM S.13169-003) and a damaged specimen (only anterior half present, ex BPBM 29281). Five branchiostegal rays. No mesopterygoid; metapterygoid narrow, splint-like, not contacting quadrate; symplectic moderately broad, with no processes reaching toward preopercle; pterygoid narrow; palatine short, reaching about halfway down pterygoid; premaxilla with tall ascending and articular processes. Lachrymal bone expanded, oval. Rostral cartilage large, unossified. Frontals large, supraoccipital small, with short pointed crest. Four pectoral radials, fully ossified in one specimen, only central portions ossified in other. Scapula an unossified strip, foramen small. Baudelot's ligament extending from base of anterior fork of cleithrum to exoccipital. Urohyal rectangular, double-pointed posteriorly. Vertebrae 10+16. Dorsal pterygiophore formula 3-22110. Two anal pterygiophores before first haemal spine. First epineural articulating with rear of parahypophysis. Caudal with 7/6 or 7/7 procurrent rays; one epural; fused hypurals 1-2 articulating with centrum. Gill rakers ossified, spiny. Five branchiostegal rays.

Sensory papillae. Based upon *T. colini*. Head papillae reduced in number (Fig. 2). Short line of more or less round papillae below eye, extending to infraorbital pore. Short upper longitudinal line behind eye on mid-preoperculum, and short vertical line with 2-3 papillae immediately below anterior part of upper longitudinal line. Below anterior margin of eye, 3-5 large round papillae. Long lower longitudinal line from lower jaw to near rear edge of preoperculum. Distinct longitudinal line from infraorbital pore to above end of operculum, line interrupted above middle of operculum by short transverse line. Prominent transverse line from just before terminal lateral canal head pore, running along anterior part of opercuium. Short line dorsoposteriorly on operculum and second short line anteroventrally on preoperculum. Preopercular mandibular series composed of inner row composed of close-set papillae and outer row composed of very wide-set papillae; a gap of no papillae behind posterior end of jaws in outer or both rows. Top of head with 2-3 papillae adjacent to postorbital pore. Short line from medial side of postorbital pore extending onto nape to above operculum on each side. Snout with 2 pairs of papillae near tip.

Remarks. Few goby genera have scaled cheeks and opercles as well as transverse papillae, such as the coral reef genera *Asterropteryx* and *Macrodontogobius*. The monotypic *Macrodontogobius wilburi* differs from *Tryssogobius* in having a disjunct oculoscapular canal present over the preopercle and opercle, a subterminal mouth, and usually possessing a large recurved canine tooth at side of dentary. It has scales which extend from the isthmus over the ventralmost part of the branchiostegal membranes; a different arrangement to that found in *Tryssogobius colini*. *Asterropteryx* always has 1-8 distinct spines on the posterior margin of the preopercle, distinct transverse rows under the eye, and, depending on species, the pelvic fins are separate or fused, with or without a frenum present. *Exyrias*, also found on coral reefs, has scaled cheeks and opercles, but has longitudinally arranged sensory papillae and an oculoscapular canal present over preopercle and opercle (disjunct). A number of other gobiine genera have scaled cheeks and opercles, but differ by an array of characters (e.g. longitudinal papillae patterns, hard pungent first dorsal fin spines in some species, differences in oculoscapular canal and preopercular pore arrangements in all species).

Although *Tryssogobius* looks and behaves rather like a tiny *Nemateleotris*, and has been previously identified as a *Ptereleotris* (Burgess *et al.* 1988), it does not appear to be related to these fishes, which are usually placed in the family Microdesmidae. Hoese (1984) proposed the

Microdesmidae as separate from the Gobiidae, while acknowledging that the group shared some derived osteological features with gobiids. Birdsong *et al.* (1988) placed *Nemateleotris* in a phenetic group (the Parioglossus group) with *Oxymetopon* and *Parioglossus*, and kept *Ptereleotris* separate because of its 3-32010 dorsal fin formula. Thacker (2000) placed *Nemateleotris* and other taxa in a separate family, Ptereleotridae, as these taxa did not fit within her redefinition of the Microdesmidae. However, Akihito *et al.*'s (2000) cytochrome *b* study shows the microdesmids *Ptereleotris* and *Gunnellichthys* together forming a separate cluster from the gobiids *Acanthogobius, Periophthalmus, Taenioides* and *Trideutiger*.

Nemateleotris, Oxymetopon and *Parioglossus* share the dorsal pterygiophore formulae of 3-22110, 26 vertebrae, 1 epural and 1 pre-anal pterygiophore, as well as having a 2-1 ratio of dorsal and anal fin elements to vertebrae. *Nemateleotris* has 27-32 second dorsal and anal fin rays, 110-160 lateral scales, no scales on the head, separate pelvic fins and a fleshy median predorsal ridge. *Tryssogobius* has 9-11 second dorsal and anal fin rays, 24-26 lateral scales, a fully scaled head, 2 anal pterygiophores before the first haemal spine, and the pelvic fins fused with frenum present (unlike *Nemateleotris, Oxymetopon* and *Parioglossus*). The relationships of Birdsong *et al.*'s Parioglossus group to other gobiids is not yet clearly established.

Other than stating that it is a gobiine, it is not possible to place *Tryssogobius* in a phylogenetic position, given the confused state of gobiid relationships at present.

Etymology. The generic name is from the Greek *tryssos*, meaning dainty or delicate, and *gobius*, a goby. The gender is masculine.

Tryssogobius colini new species

(Figs 1-6, Table 1)

Ptereleotris sp. - Burgess *et al.* 1988: 561, pl. 476.

Tiny dart-goby - Kuiter 1992: 217, fig. C.

Gobiidae sp. 1 - Masuda and Kobayashi 1994: 374, fig. 3.

Moegihaze - Suzuki and Senou 1996: 1.

Gobiidae, gen. & sp. 2 – Okamura and Amaoka 1997: 624.

Undetermined genus and species – Myers 1999: 264, pl. 165I.

Gobiidae sp. 2 – Akihito *et al.* 2000a: 1250, 1306.

Type material. HOLOTYPE - NTM S.12561-001, 29 mm SL, Loloata Island, near Port Moresby, Papua New Guinea, coll. P. Colin, September 1986, 27 m (Fig. 1). PARATYPES - NTM S.12561-002, 20 mm SL, and AMS I.38428-001, 24 mm SL, taken with holotype; WAM P.27826-[ex006], 1(21), 3 km S of aerodrome, Negros Island, Manus Island, Papua New Guinea, coll. G. Allen and R. Knight, 6 October 1982, 35-41 m; BPBM 32504, 1(23.5), sand and rubble slope, N end of Madang, Papua New Guinea, J. Randall, 2 November 1987, 40 m; BPBM 36936, 2(19-21), rubble slope, "Pohle's Reef", off Normanby Island, D'Entrecasteaux Islands, Papua New Guinea, R. Pyle and J. Earle, 8 December 1995, 82 m; BPBM 29281, 4(21-24 mm SL; plus one missing posterior half of body, no data taken), Augulpelu Reef, Belau (Palau Islands), coll. Bruce Carlson, June-July 1983, 55-67 m; NTM S.13169-003, 6(17-21), Unjulran Reef, Maumere Bay, Flores, Indonesia, coll. B. Russell, 5 November 1991; BPBM 34063, 1(26), near wreck of Japanese warship, E of Maumere Bay, Flores, Indonesia, coll. J. Randall, 11 September 1988, 30 m; BPBM 34220, 1(24.5), silty sand and rubble, lagoon side of Karang Elmoos Reef, Halmahera, coll. J. Randall, 13 October 1989, 55 m; BPBM 37676, 1(19), sloping sand channel in drop-off, W side of Augulpelu Reef, Palau, coll. J. Randall, 9 May 1997, 31 m; BPBM 37696, 1(21), on shelf flanked by numerous small caves, W side Augulpelu Reef, Palau, coll. J.L. Earle, 10 May 1997, 90 m; KPM-NI004151, 1(24), Mabul Island, near Semporna, Sabah, Malaysia, coll. Y. Hirata, 1995-1996; OMNH P-8100, 1(24), Funaura, Iriomote-jima, Okinawa Prefecture, coll. K. Yano, 1996, 55 m.

Additional material examined (non-type material). BPBM 37245, 2(24-28), hovering above bottom near *Nemateleotris decora*, along protected wall on lagoon side, short drop-off, Augulpelu Reef, Palau, coll. B. Carlson, 20 May 1991, 47 m [fish in poor condition, one broken in two]; USNM 316195, 1(23), Maribago, Maclan, Cebu, Philippines, coll. C. Ferraris, 2 August 1979, 3-5 m.

Description. Based on 23 specimens 16.5-32.5 mm SL (Table 1). Counts for holotype indicated by asterisk.

First dorsal spines VI* (23); second dorsal rays I,9 (1), I,10* (22); anal rays I,11* (23); pectoral rays 16 (1), 18 (10), 19* (11), 20 (1); segmented caudal rays

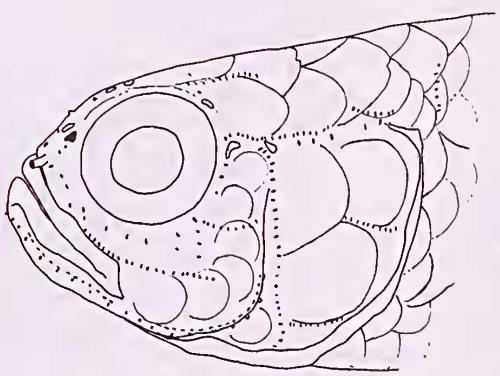

Fig. 2. Head of holotype of *Tryssogobius colini* n. g., n. sp., showing head pores and sensory papillae.

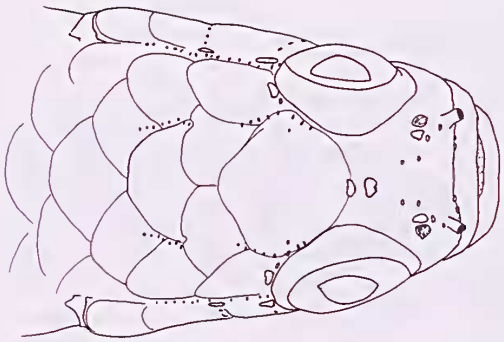

Fig. 3. Top view of head of holotype of *Tryssogobius colini* n. g., n. sp., showing head pores, papillae and predorsal scales.

Fig. 4. Ventral view of head of holotype of *Tryssogobius colini* n. g., n. sp., showing scales on branchiostegal membranes.

17* (23); branched caudal rays 6/6 (1), 7/6* (10), 7/7 (12); longitudinal scale count 24 (4), 25* (13), 26 (5); transverse scales (TRB) 7 (13), 8* (9); predorsal scale count 6* (17), 7 (3); gill rakers on outer face of first arch 3+12 (1), 4+13 (2), 4+14 (1), 5+12 (1); rakers elongate, longest raker approximately equal to length filament length; rakers on outer face of second arch 2+1+9 (1), 2+1+10 (1); rakers on inner face of first and other arches short and denticulate; vertebrae 10+16 (1).

Table 1. Summary of counts and measurements of *Tryssogobius colini* n. g., n. sp. (n = 23).

	Mean	Maximum	Minimum	Mode
First dorsal	6	6	6	6
Second dorsal	10	10	9	10
Anal	11	11	11	11
Pect. right	19	20	16	19
Pect. left	18	20	17	18
Caudal segmented	17	17	17	17
Caudal branched	14	14	12	14
Long. scales	25	26	24	25
Tr. scales back	7	8	7	7
Tr. scales forward	8	9	8	8
Predorsal scales	6	7	6	6
Caud.ped.scales	12	12	11	12
SL	22.0	32.5	16.5	21.0
Head length	6.2	8.6	4.6	5.1
Head depth	4.0	5.7	3.1	3.6
Head width	3.9	5.1	3.0	3.4
Body depth	4.6	6.6	3.0	4.0
Body width	2.6	3.9	1.7	2.4
Caud. ped. leng.	4.7	6.8	3.3	4.8
Caud. ped. dept.	2.7	4.0	2.0	2.5
Snout length	1.3	1.8	1.0	1.2
Eye width	2.3	3.2	1.6	2.3
Upper jaw	2.3	3.5	1.6	2.0
Interorbital	1.3	2.0	1.0	1.1
Pect. length	5.9	8.8	3.9	6.7
Pelv. length	5.8	9.0	4.0	4.8
Caud. length	6.6	10.5	4.5	5.8
Depressed D1	8.5	18.7	4.8	6.6

Head pores large (Figs 2,3). Posterior nasal pore immediately medial to posterior nostril, separated from nostril by thin membrane; unpaired median anterior and posterior interorbital pores close together between middle of eyes; postorbital pore behind each eye; infraorbital pore below postorbital and terminal oculoscapular canal pore above each posterior end of preopercular. No preopercular pores.

Head more or less square in cross-section, about as wide as deep at posterior preopercular margin, length 3.3-4.0 in SL, depth at posterior preopercular margin 1.3-1.8 in HL, width at posterior preopercular margin 1.4-1.8 in HL. Mouth very oblique, forming an angle of about 50-60° with body axis; anterior margin of jaws in line with middle of eye; posterior end of jaws under anterior margin of pupil. Upper jaw length 2.3-3.2 in HL. Anterior nostril at end of short tube just above upper lip; posterior nostril in contact with anterior margin of eye. Eye large, width 2.4-3.2 in HL. Interorbital broad, about equal to pupil diameter, width 3.8-6.1 in HL. Snout short, broadly rounded in dorsal view, strongly convex in side view, much less than eye length, length 4.3-6.0 in HL. Tongue tip truncate or with slightly rounded margin. Teeth small, conical and slightly curved. Outer row of teeth in upper jaw slightly enlarged and wide-set, followed by inner row of smaller close-set teeth; outer row of teeth in lower jaw composed of wide-set teeth confined to anterior end of jaw, inner row of smaller close-set teeth extending full length of dentary. No vomerine teeth. Vomer protrudes into mouth in some specimens. Posterior half of interorbital covered by part of anteriormost predorsal scale. Operculum with 3 large and 1-2 smaller scales covering whole of operculum; cheek scales large, in single row around posterior and ventral margin of eye; pectoral base covered with 7 or 8

cycloid scales; prepelvic area covered with cycloid scales. Isthmus broad, covered partly by branchiostegal membranes; membrane on each side with 2 elongate cycloid scales (Fig. 4). Body depth at anal origin 4.3-5.6 in SL. Caudal peduncle depth 7.6-9.1 in SL. Caudal peduncle length 4.3-5.8 in SL.

First dorsal fin elevated, tips of second to third dorsal spines filamentous (fourth spine occasionally filamentous), in males, fin reaching back from between middle of second dorsal fin and middle of caudal peduncle (females with high fin, sometimes with filamentous spines, second to fourth spine reaching beyond others, when fin depressed, reaching only to above anterior half of second dorsal fin), depressed first dorsal length 2.0-4.2 in SL in male, 1.7-3.7 in SL in female; last dorsal spine widely separate from preceding spines; first dorsal fin base short, dorsal fins separated by 2 rows of scales (by distance about a quarter to half base of first dorsal fin). Posterior dorsal and anal rays elongate, reaching to beyond base of caudal fin in male, short posterior rays in female barely reaching caudal fin base or to only above caudal peduncle. Pectoral fin with rounded margin, 3.5-4.9 in SL. Pelvic origin below pectoral insertion; 3.0-6.0 in SL; pelvics pointed, fifth rays longest, fin reaching to anus or beyond. Caudal fin pointed, with triangular posterior margin, a single short filament often extending from 9th segmented ray from top, caudal length 2.8-3.8 in SL.

Male genital papilla small, slender, tapering to pointed tip; female genital papilla short, rounded or conical, no lobes at tip. Papilla in both sexes sometimes concealed in groove behind anus and partly overlapped by scales.

Live coloration (Fig. 5). Based on slides of fish from Loloata Island, New Guinea (type locality). Head and body pale pearly grey-white, darkening dorsally to greenish grey, overlain by iridescent light yellowish green. Dull whitish stripe extends from rear of eye posteriorly to upper caudal fin base, separating darker back from rest of body (stripe may be partly internal; cannot be verified from slides). Iridescent yellowish green on top of head, anterior portion of lips, and scattered in front of and below eye. Several small iridescent pale blue and violet spots on opercle, preopercle, and pectoral base. Peritoneum whitish, visible through body wall.

Upper half of iris iridescent greenish gold, lower half of iris very light gold. Pale iridescent blue green mark curves over top half of pupil. First dorsal translucent greenish yellow, with narrow violet line along each dorsal spine. First dorsal spine with orange spot at base, and light orange area halfway along spine, and another light orange spot at tip. Lower two-thirds of second dorsal light greenish yellow, outer third of fin light bluish violet, with thin stripe of pale pink through centre of bluish violet region, pink stripe narrowing posteriorly. Anal fin (mostly concealed in slides) with pale blue margin. Caudal fin pale greyish yellow in centre, with bluish violet area above and below centre; bluish violet areas extend from upper and lower caudal base back towards centre of caudal margin, but not meeting at margin. Pale pinkish stripe present within blue-violet areas, a continuation of stripe on second dorsal; pinkish stripe runs from caudal base to rear margin of caudal. Pectorals transparent. Pelvics white.

Coloration in alcohol. Colour pattern indistinct in some specimens, depending upon collection and preservation history. Head and body yellowish to light brown. Snout, interorbital and suborbital darker than rest of head and body. In some specimens, narrow dusky-bordered white stripe from rear of eye above opercle along upper half of body, becoming quite diffuse and indistinct below gap between dorsals. A diffuse black spot ventrally at posterior end of caudal peduncle in some specimens. First dorsal fin grey. Second dorsal fin grey to brownish with submarginal longitudinal transparent stripe, bordered by thin black line; submarginal stripe sometimes placed close to median of fin. Anal fin grey to brownish basally, followed distally by thin black stripe, followed below by thin translucent stripe, fin grey to brownish on distal one-quarter. Pectoral and pelvic fins translucent, rays dusky. Caudal fin light brownish, with white oblique stripe from anterodorsal margin of caudal fin and similar stripe from anteroventral margin of fin, two stripes converging slightly, but not meeting posteriorly; this pattern indistinct in some specimens.

Distribution. Currently the species is known from Papua New Guinea, Indonesia, Sabah, Philippines, Palau, and the Yaeyama Islands of southern Japan. All specimens were taken from depths of 27 to at least 82 m and the species is undoubtedly more widespread.

Comparisons. Can be distinguished from the only other species in the genus by fin ray counts and colour pattern (see under *T. longipes* n. sp.).

Remarks. Of the type material, only the specimens from Loloata, Papua New Guinea, are in very good condition. The Palau specimens appear faded and do not show the ventral spot on the caudal peduncle. The pelvic interspinal membrane is visible only in one of those specimens and it is clearly torn.

There is some colour variation in living specimens (Figs 5,6), but it is unclear whether this represents separate species or regional differences. Images of *Tryssogobius* from Bali (Kuiter, unpubl.) and Kimbe Bay, New Guinea (Fig. 6; and Glenn Barrall, unpubl.) show fish with the first dorsal fin more strongly marked with a brighter yellow and darker blue than in the Loloata Island specimens. The second dorsal fin has a proximal band of yellow (instead of yellow to yellow-green spots) and the outer two-thirds of the fin is blue with a narrow stripe of yellow through it (instead of

being bluish-violet with pink to yellowish stripe). The caudal fin is mostly blue, yellow centrally, with two oblique yellow stripes from upper and lower edges of fin base. The eye is bluish to greenish yellow, with a bright to pale blue mark curving over the the top of the pupil. The overall impression is of a blue-eyed form of *T. colini* with more strongly marked fins. No specimens of these photographed fish were available.

The specimens illustrated (living and freshly dead) in Senou and Suzuki (1996) and Masuda and Kobayashi (1994) also show some differences in colour. The caudal fin has lines of yellow spots within a pale yellowish central area, a yellow spot is present at the base of each dorsal spine and ray, and a series of yellow spots extends along the rear margin of the second dorsal fin. A vivid green stripe extends from the snout tip along the dorsal midline of the body to the caudal base. An iridescent bluish white mark along the lower margin of the eye is visible in the live fish but is absent when dead (not discernible in the preserved specimen). Additionally, the first dorsal fin of the only available Japanese specimen (OMNH P-8100), from Iriomote-jima, is the tallest of all the specimens examined. And Akihito *et al.*'s Fig. 38-4 (2000a: 1306) shows differences in papillae pattern between the holotype and the Okinawa specimen. The latter shows fewer papillae in the transverse rows under the eye, and a gap in the vertical row on the opercle.

Suzuki and Senou (1996) named the Japanese form *moegihaze* or grass-green goby, as it has been often mentioned in popular diving magazines. They describe numbers of these gobies living at Funaura, Iriomotejima, at 35 m depth over sand and mud. The fish hovered horizontally a few centimetres over their "nesting holes".

Etymology. Named for Dr Patrick Colin, who collected the holotype and other material.

Tryssogobius longipes new species

(Figs 7-9, Table 2)

Type material. HOLOTYPE - BPBM 36682, 16.5 mm SL male, Indonesia, Flores, Maumere Bay, E end of Sao Wisata Resort, mud slope with isolated rock, 19.5 m, coll. J. Randall, 9 November 1990. PARATYPES - BPBM 37828, 2(16-18), same data as holotype; BPBM 37014, 2(15-17.5), Papua New Guinea, Milne Bay Province, Waga Waga, near wreck of *Muscoota*, mud, 27 m, coll. J.L. Earle, 16 December 1995; NTM S. 14630-001, 1(16.5), same data as previous; AMS I.38888-001, 1(16), same data as previous.

Additional non-type material examined . BPBM 37016, 3(20-21 mm SL), Papua New Guinea, Milne Bay Province, Waga Waga, near wreck of *Muscoota*, mud, 27 m, coll. J.L. Earle, 16 December 1995.

Description. Based on 7 specimens 15-18 mm SL (Table 2). Counts for holotype (Fig. 7) indicated by asterisk.

First dorsal VI* (7); second dorsal I,11* (7); anal I,13 (6), holotype with 14 segmented rays and no spine; pectoral 16 (3), 17* (3), one specimen with 14 rays on right side, 16 on left; segmented caudal rays 17* (7); branched caudal rays 7/6* (6); longitudinal scale count 27 (4), 28* (3); transverse scales (TRB) 7(4), 8* (3); predorsal scale count 5 (1), 6* (6); gill rakers on outer face of first arch 4+10* (1), 3+11 (1), 2+10 (1); rakers elongate, longest raker approximately equal to length filament length; rakers on outer face of second arch and rakers on inner face of first and other arches short, stubby and finely denticulate.

Head pores large. Posterior nasal pore immediately medial to posterior nostril, separated from nostril by thin membrane; median posterior interorbital pores usually fused together between middle of eyes, no anterior interorbital pores, replaced by sensory papillae; postorbital pore behind each eye; infraorbital pore below postorbital (Fig. 8). No posterior oculoscapular canal or pore above preoperculum. No preopercular pores.

Head and body compressed; head deeper than wide, length 3.7-4.4 in SL, depth at posterior preopercular margin 1.3-1.6 in HL, width at posterior preopercular margin 1.6-2.0 in HL. Mouth very oblique, forming an angle of about 60-70° with body axis; anterior margin of jaws in line with centre to upper part of of eye; posterior end of jaws just below anterior margin of pupil. Upper jaw length 2.1-2.4 in HL. Anterior nostril at end of short tube just above upper lip; posterior nostril in contact with anterior margin of eye. Eye large, width 2.4-2.9 in HL. Interorbital moderate to broad, about equal to or slightly less than pupil diameter, width 4.9-6.3 in HL. Snout short, blunt in dorsal view, strongly convex in side view, much less than eye length, length 4.9-6.3 in HL. Tongue tip truncate or with slightly rounded margin. Teeth small, conical, pointed and slightly curved. Outer row of teeth in upper jaw slightly enlarged and wide-set, followed by inner row of smaller teeth; outer row of teeth in lower jaw composed of wide-set teeth confined to anterior end of jaw, inner row of smaller close-set teeth extending full length of dentary. No vomerine teeth. Vomer may protrude into mouth. Posterior half of interorbital covered by part of anteriormost predorsal scale. Operculum with 2 or 3 large scales covering whole of operculum; cheek scales large, with 3 or 4 scales in single row around posterior and ventral margin of eye; pectoral base covered with cycloid scales; prepelvic area covered with cycloid scales. Isthmus broad, covered partly by branchiostegal membranes; membrane on each side without scales. Body slender, depth at anal origin 4.4-7.7 in SL. Caudal peduncle depth 8.3-10.9 in SL. Caudal peduncle length 5.9-7.2 in SL.

First dorsal fin pointed, third and fourth dorsal spines elongate in males, fin reaching back to first few elements

Fig. 5. *Tryssogobius colini* n. g., n. sp., 27 m depth, Loloata Island, off Port Moresby. Photograph by Pat Colin.

Fig. 6. *Tryssogobius colini* n. g., n. sp., 47 m depth, at Otto's Reef, Kimbe Bay, New Britain. Photograph by Glenn Barrall.

of second dorsal fin when depressed; females with relatively lower fin without elongate spines, fin reaching back to first element of second dorsal fin when depressed; depressed dorsal length 3.4-3.9 in SL in male, 4.3-5.6 in SL in female; last dorsal spine widely separate from preceding spines, base short; dorsal fins separated by single scale. Posterior dorsal and anal rays elongate, reaching beyond base of caudal fin in male, somewhat shorter posterior rays in female reaching to procurrent rays at base of caudal fin. Pectoral fin with central rays longest, 3.8-4.4 in SL. Pelvic origin below pectoral insertion; fifth ray elongate and filamentous in males, reaching back to about mid-base of anal fin; fin length 1.9-2.3 in SL in males, 4.1-5.0 in females. Caudal fin elongate, with triangular posterior margin, caudal length 2.8-3.3 in SL.

Male genital papilla small, conical and slender, unpigmented. Female genital papilla broad, rounded and smooth, with dusky tip.

Live coloration. The only live colour information is from John Earle's field notes. He stated that the living fish in BPBM 37014 were: "Translucent gray with a narrow dark-edged midlateral yellow stripe; dorsal edge of body with a very narrow dusky yellow stripe; two specimens with a black spot in the first dorsal fin". For the non-type specimens in BPBM 37016 (Fig. 9) he noted: "Midlateral yellow stripe from eye to end of caudal fin, a yellow submarginal stripe in each caudal lobe; second dorsal fin and anal fin with a yellow submarginal stripe; an oblique iridescent blue, dusky edged, dash-like mark adjacent to ventroposterior edge of eye with a broad yellow border below it; upper edge of iris iridescent blue".

Coloration in alcohol. Head and body pale greyish, with top of head and upper quarter of body paler in some specimens. Side of body with diffuse, dusky-bordered whitish band extending from behind pectoral base to caudal fin base. Lower half of head whitish. Snout and

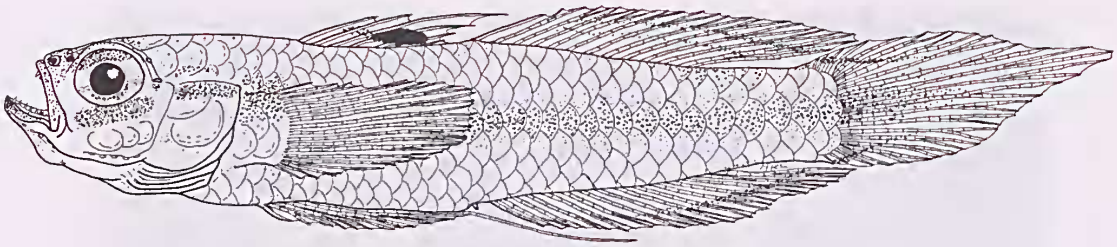

Fig. 7. Holotype of *Tryssogobius longipes* n. sp., BPBM 36682, 16.5 mm SL male.

dorsal surface of head just behind eyes plain greyish, with short white streak on dorsal midline behind posterior interorbital pore. Broad pale to dark grey stripe along lower and rear margin of eye (most intense just below eye), extending obliquely across upper part of opercle, ending as diffuse dark grey bar or dusky-bordered white bar on upper pectoral base; head stripe broken as it crosses preopercular margin. Lips and chin dusky grey. Underside of head and breast whitish.

Fins generally dusky grey to whitish. In males, first dorsal fin with broad dense black irregularly-shaped band across lower centre of fin; females with diffuse blackish band, which may be difficult to distinguish from rest of pigment, in same area. Second dorsal fin in male with narrow dark brownish line just above fin base, fin almost white proximal to dark line. Anal fin light brownish with diffuse dusky line across lower third of fin. Caudal fin greyish to brownish, with dark grey to brown oblique stripe from anterodorsal margin of fin, similar stripe extending from anteroventral margin; both stripes narrowing and converging toward rear of fin, becoming obscure before reaching pointed tip of fin; in males, area between dark stripes darker than rest of fin. Pectoral fin translucent, rays dusky brown. Pelvics whitish to faintly dusky.

Distribution. Currently the species is known only from Indonesia (Flores) and Papua New Guinea (Milne Bay). Specimens were taken from depths to 27 m and the species may be more widespread.

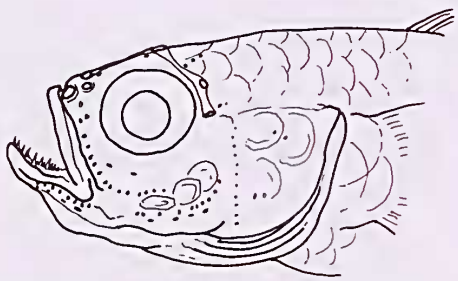

Fig. 8. Head of holotype of *Tryssogobius longipes* n. sp., showing head pores and papillae.

Comparisons. Can be most easily distinguished from *T. colini* by fin ray counts, no anterior interorbital pores, lacking scales on branchiostegal membranes, and colour pattern. *Tryssogobius colini* has I,10 second dorsal and I,11 anal fin rays (versus I,11 second dorsal and I,13 anal fin rays in *T. longipes*). *Tryssogobius colini* is pale blue-grey with a whitish lateral stripe, light blue to violet spots on the side of the head and no dark fin markings (*T. longipes* is grey with a yellow to orange lateral stripe, which may form a dark spot under the eye, and has a black spot in the first dorsal fin). Additionally, *T. longipes* has a shorter caudal peduncle (4.3-5.8 in SL in *T. colini* versus 5.9-7.2 in SL in *T. longipes*).

Remarks. The three specimens in BPBM 37016 are similar in coloration to *T. longipes* but the blackish diagonal stripe across the head is restricted to the lower rear edge of the eye (Fig. 9). Additionally, they have fin ray counts resembling *T. colini*, but all three specimens have only five first dorsal fin spines. The depressed first dorsal fin is longer, and one has a deformed second dorsal fin. The fish are not in good condition, with most scales lost. John Earle's notes on live colour indicate that, when live, the fish were coloured similarly to *T. longipes*; he did not refer to the male having the black area on the first dorsal fin. Additional specimens are required to confirm their status.

Etymology. From the Latin, *longus*, and *pes*, foot; in reference to the elongate pelvic fins, especially developed in males.

ACKNOWLEDGMENTS

Many thanks to Pat Colin, who first brought our attention to these elegant fishes and provided colour slides; to Jack Randall, who sent additional specimens, slides and information; to Glenn Barrall, for the use of his slides; to Hiroshi Senou, for facilitating the loan of specimens from Iriomotejima and Malaysia; and to the Northern Territory Government Interpreter and Translator Service.

Fig. 9. *Tryssogobius longipes* n. sp., BPBM 37016, non-type specimen, Milne Bay. Specimens in this lot differ from the types (see text). Photograph by Jack Randall.

Table 2. Counts and measurements of *Tryssogobius longipes* n. sp.

	BPBM 36682	BPBM 36682 Holotype	BPBM 36682	NTM S.14630-001	BPBM 37014	AMS I.38888-001	BPBM 37014
First dorsal	6	6	6	6	6	6	6
Second dorsal	11	11	11	11	11	11	11
Anal	13	14	13	13	13	13	13
Pect. right	16	17	17	16	17	14	16
Pect. left	17	17	18	16	12	16	16
Caudal seg.	17	17	17	17	17	17	17
Caudal br.	13	13	13	13	13	13	-
Long.scales	27	28	28	27	27	27	28
TRB	8	8	7	8	7	7	7
TRF	9	10	9	8	9	8	8
Pred.scales	6	6	6	6	6	6	5
Caud.ped.sc.	11	12	11	9	10	11	-
SL	18.0	16.5	16.0	16.5	17.5	16.0	15.0
Head length	4.7	4.2	4.0	4.4	4.4	4.3	3.4
Head depth	3.3	3.2	2.8	2.9	2.8	2.7	-
Head width	2.6	2.7	2.5	2.3	2.2	2.5	-
Body depth	3.2	3.1	3.2	3.0	2.5	3.1	3.4
Body width	1.8	1.6	1.5	1.4	1.3	1.3	1.3
Caud. pd. leng.	3.0	2.8	2.3	2.3	2.5	2.4	2.5
Caud. pd. dept.	2.3	2.0	1.8	1.8	1.6	1.7	1.5
Snout length	0.9	0.7	0.8	0.8	0.7	0.7	0.7
Eye width	1.8	1.5	1.4	1.6	1.8	1.5	1.4
Upper jaw	2.2	1.8	1.7	1.9	1.8	1.8	1.6
Interorbital	0.9	0.8	0.8	0.8	0.7	0.7	0.7
Pect. length	4.7	3.8	3.7	4.0	4.0	3.6	3.4
Pelv. length	9.6	8.8	3.9	7.5	3.5	3.2	6.5
Caud. length	5.5	6.0	5.5	5.7	5.3	5.3	-
Dep. D1	5.3	4.3	3.4	4.3	3.1	3.7	3.8

REFERENCES

Akihito, Sakamoto, K., Ikeda, Y. and Iwata, A. 2000a. In: Nakabo, T. (ed.) *Fishes of Japan with pictorial keys to the species. Second edition.* Tokai University Press, Tokyo.

Akihito, Iwata, A., Kobayashi, T., Ikeo, K., Imanishi, T., Ono, H., Umchara, Y., Hamamatsu, C., Sugiyama, K., Ikeda, Y., Sakamoto, K., Fumihito, A., Ohno, S. and Gojobori, T. 2000b. Evolutionary aspects of gobioid fishes based upon a phylogenctic analysis of mitochondrial cytochrome *b* genes. *Gene* **259**: 5-15.

Birdsong, R.S., Murdy, E.O. and Pezold, F.L. 1988. A study of the vertebral column and median fin osteology in gobioid fishes with comments on gobioid relationships. *Bulletin of Marine Science* **42**(2): 174-214.

Burgess, W.E., Axelrod, H.R. and Hunziker, R.E. 1988. *Dr. Burgess's atlas of marine aquarium fishes.* TFH Publications, Neptune City, New Jersey.

Hoese, D.F. 1984. Gobioidei: Relationships. In: Moser, J. *et al.* (eds) *Ontogeny and systematics of fishes.* Pp. 588-591. American Society of Ichthyologists and Herpetologists Special Publication No. 1: Kansas.

Hoese, D.F. 1986. Indo-Pacific genera of gobiid fishes. Abstract only. In: Uyeno, T., Arai, R., Taniuchi, T. and Matsuura, K. (eds) *Indo-Pacific fish biology. Proceedings of the second international conference on Indo-Pacific fishes.* P. 942. Ichthyological Society of Japan, Tokyo.

Hoese, D.F. 1993. A review of the current state of knowledge of the classification of gobioid fishes. Abstract only. *Systematics and evolution of Indo-Pacific fishes. Program and abstracts of papers. Fourth Indo-Pacific Fish Conference, Bangkok, Thailand, 28 November - 4 December 1993.* P. 40.

Kuiter, R.H. 1992. *Tropical reef-fishes of the western Pacific, Indonesia and adjacent waters.* PT Gramedia Pustaka Utama, Jakarta.

Masuda, H. and Kobayashi, Y. 1994. *Grand atlas of fish life modes. Colour variation in Japanese fish.* Tokai University Publishing.

Myers, R.F. 1999. *Micronesian reef fishes. A comprehensive guide to the coral reef fishes of Micronesia. 3rd revised and expanded edition.* Coral Graphics, Barrigada, Guam.

Okamura, O. and Amaoka, K. 1997. *Sea fishes of Japan.* Yamakei Publishers, Tokyo [in Japanese].

Suzuki, H. and Senou, H. 1996. Fish of the month. Moegi goby (new name). *I.O.P. Diving News* **7**(6): 1. [in Japanese].

Thacker, C. 2000. Phylogeny of the wormfishes (Teleostei: Gobioidei: Microdesmidae). *Copeia* **4**: 940-957.

Accepted 8 October 2001